

REMARKS

Claims 6 and 11-20 are pending in the application, with claims 11-20 having been withdrawn from consideration. Claims 1-5 and 7-10 have been canceled. Claim 6 has been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicants regard as their invention. The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **June 30, 2004**.

Claim Rejections

Claim 6 is rejected under 35 USC §103(a) as being unpatentable over Yamamoto et al. (U.S. Patent No. 5,520,269) in view of Uramoto et al. (U.S. Patent No. 4,642,011). Further, claim 6 is rejected under 35 USC §103(a) as being unpatentable over Yamamoto et al. in view of Uramoto et al. and Hufnagl et al. (U.S. Patent No. 4,331,041).

The present invention is a pin connection structure for a floating type brake disc. The pin connection structure of the present invention has the following characteristics. The pin is the completely hollow. A rounded circular convex shape is formed in part of an inner peripheral surface of an end portion of this hollow pin by beveling. An outer peripheral surface of the pin is not beveled, but in an angular shape as shown in FIGS. 4A, 4C, 4E, 4F and 4G of the present invention. The pin is surface-treated, and has a hard surface treated layer. There is a spring provided between the washer at the caulking side and the washer at the hub/disc side, and these washers are flat and have no steps. In order to

connect the hub and the disc, the pin end portion having the hard surface-treated layer is subjected to roller caulking and deformed. Deformation of the pin end portion after caulking is very small, and the inner diameter portion of the pin end portion is smaller than the outer diameter of the shaft portion. The angular outer peripheral surface of the pin end portion does not abut to the upper surface of the washer.

Starting on page 2 of the Office Action the Examiner rejects claim 6 under 35 USC §103(a) as being unpatentable over the patents of Yamamoto et al. in view of Uramoto et al. Starting on page 4 of the Office Action the Examiner rejects claim 6 under 35 USC §103(a) as being unpatentable over the patents of Yamamoto et al. in view of Uramoto et al. and Hufnagl et al. In the Office Action the Examiner asserts that Yamamoto et al. teaches the subject matter of independent claim 6 with the exception that (1) the hollow pin is made of a metal having a surface-treated layer, (2) the hollow pin is formed in a rounded or arced convex shape in part of an inner periphery of an end portion of the hollow pin, (3) the metal is an aluminum alloy of a ferrous metal, and (4) the surface-treated layer is an oxide corrosion-resistant film and one of chromium plating and nickel plating.

The Examiner asserts that Uramoto et al. discloses deficiencies 1, 3 and 4 listed above. The Examiner further asserts that Hufnagl et al. discloses deficiency 2.

Claim 6 has been amended to further distinguish it over the prior art patent references. Claim 6 has been amended to add four features. First, claim 6 is amended to indicate that the hollow pin has a shaft portion which does not have a step on an outer surface of an intermediate portion. Second claim 6 is amended to indicate that an outer

peripheral surface of the hollow pin is not beveled but has an angular shape. Third claim 6 is amended to indicate that a spring is provided between a washer at a caulking side of the hollow pin and a washer at a hub/disc side of the hollow pin. Fourth, claim 6 is amended to indicate that an end portion of the hollow pin has no sharply bent edge on which the caulking pressure is applied. None of these features are described in the prior art.

Therefore, claim 6 patentably distinguishes over the prior art of record by reciting,

“A pin connection structure for use in a floating type brake disc assembly comprising: a hub; an annular disc which is concentrically disposed around said hub with a clearance therebetween, said hub and said disc having plural sets of semicircular connecting dents opening toward said clearance to thereby form respective inserting holes; a hollow pin having a shaft portion which does not have a step on an outer surface of an intermediate portion inserted into each of said inserting holes with a washer fitted on an end portion of said hollow pin which is subsequently caulked radially outward by a roller for fixing said washer in position, an inner diameter portion of the end portion being only slightly expanded by caulking the hollow pin, and wherein the expansion does not exceed an outer diameter of a shank of the pin, wherein an outer peripheral surface of the hollow pin is not beveled but has an angular shape, a spring is provided between a washer at a caulking side of the hollow pin and a washer at a hub/disc side of the hollow pin, wherein said hollow pin is made of a metal having a surface-treated layer, and wherein said hollow pin is formed in advance into a rounded or arced convex shape in the end portion of the pin in at least a part of its inner periphery to the extent that the end portion has no sharply bent edge on which the caulking pressure is applied, wherein said metal is an aluminum alloy or a ferrous metal, wherein said surface-treated layer is an oxide corrosion-resistant film and one of chromium plating and nickel plating.” (Emphasis Added)

Therefore, withdrawal of the rejection of claim 6 is respectfully requested.

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Conclusion

In view of the aforementioned amendments and accompanying remarks, claim 6, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP



George N. Stevens
Attorney for Applicants
Reg. No. 36,938

Atty. Docket No. 001358
Suite 1000, 1725 K Street, N.W.
Washington, D.C. 20006
(202) 659-2930
GNS/nk



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